Area in Proximity to former Dinoseb Disposal Ponds

I. Summary:

Three (3) ponds (SWMU's 69, 70, & 71) have been reported to be formerly present in the area between the DCA unit (Unit 6) and the maintenance service building (see figure xx). The ponds were reportedly shallow unlined basins used to dispose of off-spec dinoseb. Buildings and paved areas have been constructed over the former ponds. Soil samples have revealed that dinoseb contamination is present in this area and that it seems to have migrated to the east/ southeast (see Figure xx – soil copcs in soil). Based on these detections, the area outlined for remediation is found in Figure xx.

II. Evaluation of Alternatives:

A list of each alternative and a brief description is provided below. Also provided are benefits that may be attributed to that specific technology. To help compare each alternative, table xx found in Appendix xx rates how well each alternative meets certain critera.

Option xx: ***In Situ* Stabilization**:

The *in situ* stabilization (ISS) approach is not intended to remove or destroy COCs in soils, although some loss of VOCs from evaporation during soil mixing is a common ancillary effect of this remedy. Instead, ISS is intended to reduce the leachability and mobility of COCs in soil. With their mobility reduced, COCs are less likely to migrate from soils to groundwater, effectively reducing the source of groundwater impact. Stabilized soils also typically pose a lower risk than unstabilized soils with respect to both vapor intrusion and direct exposure.

ISS would require the removal of all surface improvements (including foundations), pavements, utilities, and other infrastructure in the areas to be treated. Once this removal is completed, soils would be excavated and mixed with a stabilizing material (the stabilant) using specially-equipped augers, trackhoes, or other equipment. This mixing would be performed primarily within the boundaries of the soil excavation. The stabilant may be fly ash, Portland cement, or another pozzolanic material. The preferred stabilant and mix ratios to meet remedial goals would be determined as a part of the Remedial Design process (see Section 10.0). Excavation and mixing would extend to approximately the top of the Perched Zone, at a typical depth of 17 feet.

At the conclusion of ISS, soils would be graded for desired drainage and remain in place within the excavation. Note that ISS often results in a slight volumetric increase in soil volume, so there may be a slight increase in the ground surface elevation within the ISS area. An estimated timeframe to implement this approach is approximately 6 months.

Assuming the stabilant and mix ratios were effective in stabilizing the soils, this approach should reduce the leachability and mobility of soil COCs immediately upon completion. This effect should continue for several decades, depending on the stabilant used. ISS will likely not, however, result in an immediate reduction in groundwater COC levels.

Such a reduction should occur, but may require a period of years to observe in the Perched Zone, and even longer in the Alluvial Aquifer.

Stabilized soils may pose less of a threat through direct exposure to future site workers and other receptors, since COCs are more firmly “bound” to the soil particles, and may therefore be less capable of migrating from the stabilized soils to receptors via skin absorption, dust generation, etc. This magnitude of this reduction is, however, difficult to predict until treatability tests are completed.

In summary, ISS would have both good short term and long term effectiveness in reducing the direct contact and vapor intrusion risks posed by soil COCs in the treatment area. It would have low short term effectiveness, but good long term effectiveness in improving groundwater quality at the site. This remedy will have to be maintained in perpetuity to continue to be effective. If the stabilant used begins to break down over time, therefore, it may be necessary to repeat the ISS process to maintain the effectiveness of the remedy.

The cost to perform ISS for the identified areas in Figure 8B is approximately $2.1 Million. Note that these costs do not include the costs of removing buildings and aboveground structures, since those demolition costs are addressed as a part of another remedy element (see Section 7.0 of this FS). These costs do include, however, the removal of slabs, pavement, and other at-grade and below-grade structures from the excavation footprint. There should be no on-going costs for operations and maintenance of the remedy, and no costs for decommissioning the remedy. Costs for a repeat of ISS, if necessary, are not included. A breakdown of these implementation costs is provided in Appendix B.

<u>Option xx: Excavation:</u>

Excavation with off-site disposal permanently removes soil COCs from the Facility, through bulk removal of contaminated soils and their permanent placement in an off-site disposal facility. Excavation with off-site disposal would require the removal of all surface improvements (including foundations), pavements, utilities, and other infrastructure. Once this removal is completed, soils would be excavated and segregated by waste classification (i.e., hazardous vs. non-hazardous). Hazardous and non-hazardous waste soils would remain segregated through the remainder of the remedy process. Soils would be transferred to container trucks and transported from the site to licensed hazardous and non-hazardous solid waste disposal facilities. Excavation would extend to approximately the top of the Perched Zone, at a typical depth of 17 feet.

Soils from the sidewalls of the resulting excavation would be analyzed at completion to confirm that cleanup objectives had been met, with additional excavation as necessary to address any locations identified to still have elevated COCs. As soil removal was completed, the excavation would be backfilled with clean fill. This fill would have to be purchased and imported from a local supplier, since there is no on-site source of backfill. Backfill would be graded for desired drainage. An estimated timeframe to implement this approach is approximately 6 months.

Because the soil COCs within the excavation area would be completely and permanently removed from the Facility, direct contact and vapor intrusion risks would be eliminated or soils within the excavation area. The removed soils would also no longer function as a source of groundwater contaminants. As with ISS, excavation will likely not, however, result in an immediate reduction in groundwater COC levels. It will likely require a period of years to observe water quality improvements in the Perched Zone, and potentially even longer in the Alluvial Aquifer.

In summary, excavation with off-site disposal would have good short- and long-term effectiveness in reducing risk issues associated with direct soil contact, and good long-term effectiveness (but not short-term) in reducing groundwater COC levels. Move to Justification section

The cost to perform excavation with off-site disposal is $11.9 Million. Note that these costs do not include the costs of removing buildings and aboveground structures, since those demolition costs are addressed elsewhere (see Section 7.0 of this FS). These excavation costs do include, however, the removal of slabs, pavement, and other at-grade and below-grade structures from the excavation footprint. There should be no on-going costs for operations and maintenance of the remedy, and no costs for decommissioning the remedy.

A breakdown of these implementation, annual, and decommissioning costs is provided in Appendix B.

Option xx: SVE extraction: Wells would be drilled into the soil and a vacuum would be applied to suck out the contaminant. A pilot test would be conducted to obtain optimum vacuum and well spacing. This may be appropriate for dinoseb that is locked in the water molecules, but is relatively in-effective for dinoseb locked in the soil.

Optoin xx: No Further Action (NFA): Under a No Further Action (NFA) approach, no remedy would be implemented to address COCs in soils. Soils would be left in their existing condition, with no additional measures taken to reduce COC concentrations, and no controls implemented to limit potential public exposure to the soils, or to vapor intrusion risks associated with the soils.

Option xx: Soil Cap; a asphalt Cap is listed as alternative to cover the entire area (see section xx for details). This option can work in concert with one of the above options to help prevent rain water infiltration from carrying contamination into the perched aquifer.

III. Justification for Selection:

Based on the evaluation of the remedies offered, the option proposed is option xx – In-Situ Stabilization. This poses to address contamination better than Options xx & xx. When compared to Option xx (excavation), both options have good short- and long-term effectiveness in reducing risk issues associated with direct soil contact, and good long-term effectiveness (but not short-term) in reducing groundwater COC levels. However, the cost to implement excavation is estimated to be up to 4 times as much as stabilization.

IV. Selected Remedy(s)/Site Plan:

The following is an overview of the remediation technologies chosen to address each AOC:

Dino ponds
Drum vault
Yellow stained areas
Other dinitro disposal alleged areas
Alluvial gw
Perched gw